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## Original Article

### Knowledge on street food safety among a selected group of Sri Lankan students; A cross-sectional study

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#### Abstract

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**Introduction:** Street food has been frequently reported to contribute to foodborne illnesses. As a result, the safety of street food has been given major attention. Numerous studies have shown that a lack of knowledge among university students regarding street food safety results in a risk of contracting food-borne illnesses.

**Objective:** Determine the knowledge of street food safety among undergraduate students.

**Methodology:** A pre-tested, self-administered questionnaire was used to collect data related to students' socio-demographic details and food safety knowledge. In this study, 332 street food consumers (220 females and 112 males) voluntarily participated. The data were analyzed with SPSS version 26 using  $p$  value  $< 0.05$  as statistical significance. Descriptive and inferential statistics were used for analysis.

**Results:** The study showed that street food consumers' knowledge on food safety was average. The knowledge regarding food safety was not significantly associated with socio-demographic factors assessed (gender, age, ethnicity, marital status, study program, academic year, and accommodation method) ( $p > 0.05$ ). The majority of consumers were aware of the possibility of food contamination, the value of washing hands, and the need for adequate hygiene in order to prevent foodborne illnesses. However, some aspects related to knowledge of food safety caused concerns. The majority of customers found it difficult to understand that food does not transmit AIDS.

**Conclusion:** Young adults should be educated about food hygiene and safety. However, further studies are necessary to confirm these findings.

**Keywords:** Street foods, Food safety, Knowledge, Hygiene, Gender, University students

## Introduction

“Street food” refers to all consumables that are prepared, cooked, and served in public, such as on the streets, sidewalks, or in busy markets from mobile stalls, carts, food trucks, etc. (Choudhury et al., 2011). It is convenient because it is easily available, cheap, and easy to afford as well as tasty, authentic, and culturally enriching. Thus, it plays a prominent role in eating habits, particularly in middle and lower income groups. Further, it provides the local community with economic support and employment by increasing local food processing systems and agricultural producers (Khairuzzaman et al., 2014).

Customers, especially young students, like street food due to its taste, accessibility, variety, and affordability (Sanlier et al., 2018). The young generation does not have the time to cook and prepare their own food due to their hectic schedules, higher education commitments, and personal culinary demands. As a result, they are tempted to purchase street food more frequently (Wilcock et al., 2004).

Foodborne illnesses are growing in importance as a public health issue in both developed and developing nations (AL-Mohaithef et al., 2020). In developing countries, consumption of street food has been linked to the spread of foodborne illnesses (Ma et al., 2019) and is recognized as a frequent means of transmitting drug-resistant bacteria (Güven et al., 2010). Elevated levels of coliform bacteria have been detected in street foods in several countries (Ma et al., 2019). In addition, epidemiological studies suggest that a sizable fraction of food poisonings are caused by street foods. Nevertheless, there have been a number of reported instances of food poisoning outbreaks attributed to street food. Foodborne bacterial pathogens commonly found in street food include *Bacillus cereus*, *Clostridium perfringens*, *Staphylococcus aureus*, and *Salmonella* spp. In addition, people who eat street food are said to contract food-borne illnesses such as cholera and typhoid fever (Rane, 2011).

Food safety has long been the subject of scholarly research, and street food shows a weak link in food safety supervision (Ma et al., 2019). The safety of street food remains a public health concern, especially in developing countries like Sri Lanka where foodborne illnesses are associated with food practices. In 2012, Gunasekera et al. (2017) in Sri Lanka reported that the prevalence of *Bacillus cereus* was 56% in Chinese-style fried rice available in Colombo (Gunasekera et al., 2017). Efforts to prevent foodborne illnesses require sufficient knowledge of hygiene and safety standards from both food processors and consumers.

The lack of awareness of street food safety is a significant issue among undergraduates. Numerous research has indicated that university scholars possess insufficient awareness about street food safety, which endangers their health from food-related illnesses (Luo et al., 2019). Enhancing public awareness and education regarding food safety can facilitate prompt corrective measures and precautionary steps by the authorities.

Literature on customer’s knowledge of food hygiene and the safety of street food in Sri Lanka is limited. Therefore, there is a need for studies in this avenue as Sri Lanka has been experiencing a significant increase in the street food vendor population in recent years, synchronous to the population growth in urban areas. Compared to the other countries in the region, the status of the street vendors in Sri Lanka is in a better position, and business activities are operated in places like pavements of major roads, sides of streets, and some assigned places allocated by authorities such as municipal councils (Karunaratna & Tjandra, 2021).

## Methods

A descriptive cross-sectional study was conducted at Kaatsu International University (KIU), Sri Lanka. A total of 332 undergraduates (220 females and 112 males) were randomly selected. Data was collected using a pre-tested,

self-administered questionnaire containing four sections and a total of 43 items. The questionnaire was created based on previously published studies (Luo et al., 2019; Ali et al., 2018) and the WHO Five Keys to Safer Food (Mwamakamba et al., 2012). The questions/statements were modified to suit the objectives of the study. To determine different areas of the self-administered questionnaire, the participant had to select the direct answers/ multiple choices in each section. To ensure the quality and reliability of the questionnaire, the pre-test was conducted twice. The first pre-test was conducted among 20 students and the second pre-test was conducted among 10 university students who were not included in the formal investigation.

The first section consisted of socio-demographic details. The second section assessed the knowledge of participants related to street food safety. Each correct knowledge item reported was awarded a score of 1 point. Incorrect knowledge was awarded a 0 score (including “do not know” and “No idea”). For the Likert scale, if “agree” was the correct answer, then “agree” was scored as 4 points while “Neutral”, “disagree” and “No idea” were scored 3, 2 and 1 points respectively or if “disagree” was the correct answer, then “disagree” was scored as 4 points while “Neutral”, “agree” and “No idea” were scored 3, 2 and 1 points respectively. For total knowledge score calculation, a score of less than 22 was considered to indicate a poor level of food safety knowledge, 22-35 denoted an average level, and more than 35 was considered good.

IBM SPSS version 26 was used to examine the data, and a p value < 0.05 was used to determine statistical significance. Descriptive and inferential statistics were used for data analysis. The Chi square test was used to assess the association between demographic characteristics and knowledge score of street food safety.

Ethical approval was obtained from the Ethical Review Committee of KIU (KIU\_ERC\_21\_57).

## Results

Among the total undergraduates (n=332), 220 (66.3%) were female and 112 (33.7%) were male consumers. Consumers' age ranged from 18 to 45 years, with a majority of 79.8% (n=265) participants between 18-25 years of age. Socio-demographic factors (age, gender, ethnicity, marital status, study program, academic year, and accommodation method) did not have a significant effect on the level of food safety knowledge of the consumers ( $p > 0.05$ ).

The mean knowledge scores among male and female students were  $28.59 \pm 4.61$  and  $29.02 \pm 4.19$ , respectively. No statistically significant difference was observed between the knowledge levels and gender ( $p=0.267$ ).

The results reflect that most respondents (89.5%) had an average knowledge regarding food safety. 8.7% of respondents had poor knowledge while the least number of respondents (1.8%) had good knowledge. The mean consumer food safety knowledge score was  $28.876 \pm 4.33$  (Figure 1).

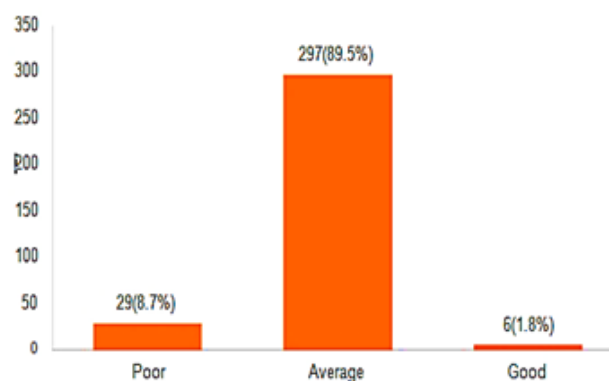


Figure 1: Distribution of total knowledge level among participants

According to the responses of the consumers on food safety knowledge statements mentioned below, more than half of consumers (53.6%, n=178) were aware that eating and drinking at work raises the risk of food contamination. Some consumers (7.8%, n=26) disbelieved that AIDS can be transmitted by food while 81.9% (n=272) of respondents had no idea about transmission of

AIDS. More than half of the consumers (69.3%, n=230) knew that using gloves lowered the risk of food contamination. Most of the consumers (53.6%, n=178) were aware that partially cooked food increases food contamination. Less than half of consumers (44.9%, n=149) believed that reheating cooked foods contributed to food contamination. Of the respondents, 16.3% (n=54) wrongly believed that street food can be kept in the refrigerator for a long time. Most of the participants had no idea about food safety. Almost half of consumers (50.6%, n=168) knew that proper cleaning and disinfection of food utensils reduced the risk of contamination.

Majority of the females (68.6%, n=151) and males (66.1%, n=74) knew the definition of non-communicable diseases (NCDs) while only 8.6% (n=19) females and 5.4% (n=6) males knew that excessive intake of salt, sugar, and oil is the major cause for these types of diseases. Most of the participants could correctly select diabetes, cancer, and cardiovascular diseases as NCDs from the given list. Some participants wrongly believed that HIV and COVID-19 are also considered as NCDs. Almost all the respondents, 91.1% (n=102) males and 90% (n=198) females had an idea about the symptoms of foodborne illnesses. More than half of the males (59.8%, n=67) and females (61.4%, n=135) knew that foodborne diseases can be transmitted by consuming street food.

More than three-quarters of the participants, 75.9% (n=85) males and 78.2% (n=172) females knew that feco-oral route is the main transmission mode of foodborne diseases, but only 30.4% (n=34) males and 28.2% (n=62) females could identify that foodborne diseases can be transmitted by infected animals. The majority of participants, 67.0% (n=75) males and 80.5% (n=177) females knew that bacteria is the most common type of foodborne pathogens. A lower number (25.9%, n=86) of students wrongly stated blood transfusion, unprotected sexual intercourse, and mother-to-baby via birth canal as the transmission methods of food-borne diseases.

## **Discussion**

According to the findings of this study, the majority of university students had average knowledge regarding street food safety, despite the fact that a greater number of university students pursued science-related degrees. In a similar study in Haiti, it was seen that consumers of street food had an average level of knowledge (Samapundo et al., 2015). However, these results contradict the previous findings of Mamun et al. (2020), which concluded that street food consumers had poor knowledge regarding food safety (Mamun et al., 2020). In contrast, a high level of food safety knowledge was observed among the veterinary medicine students at Trakia University, Bulgaria (Stratev et al., 2017). It is evident that health education on food handling is necessary to minimize street foodborne infections. However, little attention is currently focused on educating the Sri Lankan population in this regard and has to be addressed immediately with a view to change the behavior of consuming street food.

Further, there is insufficient understanding of food safety in Sri Lanka amongst young adults, due to a lack of educatory programs during primary and secondary school education on food safety. Further, public awareness through social media and televisions, newspapers is not given prominence in Sri Lanka. Previous reports have highlighted the need to enhance consumers' level of food safety knowledge which will greatly contribute to the prevention of foodborne illness outbreaks (Ali et al., 2018). The study shows the importance of health education of the consumers by public health institutions using the mainstream media (radio, television, print, online, and social media) to develop knowledge related to food safety, that will benefit public in everyday lives.

The purchasing power by consumers for street food provides perhaps the strongest motivating force for vendors to alter their food-handling practices. Ultimately, it is the consumer who makes the choice of what to consume and from

whom to purchase it. Street food consumers also will bear the consequences if that food is unsafe. Unfortunately, consumers are often unaware of the relationship between contaminated food and foodborne diseases. Therefore, consumers must be involved in efforts to improve the safety of street-vended food. To achieve this, relevant health authorities should make it a priority to increase the safety of street food and start suitable training programs, national seminars, social media campaigns and workshops on foodborne illnesses, food safety, and food security for both school and university students. The inclusion of food safety and security themes in textbooks of school and university curricula would also present chances for raising public understanding of nutrition and food security. To raise consumer awareness, attitudes, and behavior in Sri Lanka about food safety, further legislation and initiatives should be promoted.

Although this study did not reveal a statistically significant difference among gender, age, civil status, ethnicity, accommodation, employment, other studies globally have shown contradictory and similar results. A study conducted in Canada reflected that males in the Faculty of Science had relatively higher knowledge than females in the Faculty of Science, both of whom had relatively higher knowledge than all students in other Faculties (Courtney et al., 2016). In addition, the results of a study conducted in Vietnam revealed that no significant difference occurred between the food safety knowledge levels of

the consumers on the basis of gender. However, significant differences occurred based on age, education level, food safety training status and location (Samapundo et al., 2015). Socio-cultural differences in these populations could be the reason for the difference in results seen. The results of the study strongly emphasize that properly designed, continuous seminars, workshops, and training programs and strengthening health education about food safety are major strategies to enhance food safety awareness among university students and thus prevent foodborne illnesses.

### Conclusion

In conclusion, the majority of participants had an average knowledge regarding street food safety, reasons for food contamination and food borne diseases. Further studies are required to confirm these findings.

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### Conflicts of Interests

There are no conflicts of interest.

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